

**What we know**

- examining  $y = ax^2$  and  $y = (x - h)^2$
- VERTICAL Stretch and HORIZONTAL Shift
- Using MAPPING Technique to graph transformed Function.

**What we will be learning**

- examining vertical shift up/down 'k' units.  $y = x^2 + k$
- VERTICAL Shift up/down 'k' units.
- Using MAPPING Technique to graph transformed Function.

**Work to help you remember**

Pg. 262 # 1, 2, 3ade, 4cf, 5bf

Feb 22-11:43 AM

(5.2) Part C: Examining Quadratic Functions in the Form  $y = x^2 + k$ Compare the transformed graph to the standard graph of  $y = x^2$ .

Function	"k" value	vertex	position of graph compared to standard curve
1) $y = x^2 + 5$			
2) $y = x^2 - 7$			
3) $y = 5x^2 - 8$			
4) $y = -x^2 + 4$			

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## Summary:

- ★ "k" determines the  shift of the quadratic function.
- ★ If  $k > 0$ , the graph of  $y = x^2$  is shifted  by "k" units.
- ★ If  $k < 0$ , the graph of  $y = x^2$  is shifted  by "k" units.

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\*\*To graph any parabola in the form  $y = x^2 + k$ :

- graph  $y = x^2$
  - Use MAPPING Technique
    - shift every point up/down accordingly
- same direction as sign

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## 1. Graph using transformations:

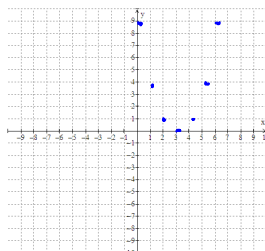
$$y = a(x-h)^2 + k$$

$$y = (x-3)^2$$

List the transformations in order:

$$a = +1$$

$$(h, k) = (3, 0)$$

001 up 1  
002 up 4  
003 up 9  
004 up 16

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## 2. Graph using transformations:

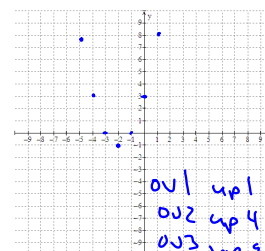
$$y = a(x-h)^2 + k$$

$$y = (x+2)^2 - 1$$

List the transformations in order:

$$a = +1$$

$$(h, k) = (-2, -1)$$

001 up 1  
002 up 4  
003 up 9

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3. Graph using transformations:  
 $y = -2(x-2)^2 + 4$   
List the transformations in order:  
 $a = -2$   
 $(2, 4)$


001

002

003

up 1

up 2

up 3

comp

up 4

up 9

2

2

8

10

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3. Graph using transformations:  
 $y = -1/2(x+3)^2 + 4$   
List the transformations in order:  
 $h = -3$   
 $(-3, 4)$   
 $a = -1/2$


001

002

003

004

up 1

up 2

up 3

up 4

comp

up 7

up 12

2

2

8

10

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